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THE FUEL PROBLEM IN SLOVENIA

Stane Jesih

Slovenia has black and brown coal and lignite mines. The table below lists the mines and the type of coal and lignite.

<u>Mine</u>	Type	Caloric Value (cal per kg)	Percent of Total Depusits by Mine	Remarks
Timav Trbovlje-Hrastnik Zagorje Senovo Zabukovca Lasko Liboje Pecovnik Sentjanz Kanizarica Kocevje Velenje Ilirska Bistrica	Black Brown " " " " " " Lignite	7,000 1,300 1,300 1,200 1,500 1,600 1,000 1,700 3,500 3,500 3,700 2,600 1,700	0.06 9.12 5.38 0.80 0.17 0.31 0.07 0.05 0.63 0.39 0.39 79.00	Slovenian coal is from 620,000 to 55 million years old. Black coal is the oldest and lignite the youngest

All known deposits of black and brown coal and lignite are included above, including deposits not yet exploited.

Considering that Slovenian coal deposits are not inexhaustible and that coal has become a raw material, Slovenia must aim to utilize the entire potential heating capacity of the coal. If Slovenia continues to exploit coal at the same rate as it is doing today, the black and brown coal deposits will last for only two generations, whereas the lignite deposits will last some tens of generations.

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In 1938, Yugoslavia produced approximately 6 x 10⁶ tons of coal, or 0.4 percent of the coal produced in the world. It was astimated in 1939 that deposits in Yugoslavia amounted to 48 x 10⁹ tons or 1'1,400 of world deposits. Large deposits of lignite and brown coal have been discovered since the liberation. With the acquisition of the liberated districts, Yugoslavia acquired the Rasa and Ilirska Bistrica mines. The coal deposits in Slovenia are 1/18 of the estimated deposits in Yugoslavia.

The population of Yugoslavia is 1/137 or 0.75 percent of the total world opulation (2.4 billion). World deposits amount to 2,900 tons of coal per capita; deposits in Yugoslavia amount to only 300 tons per capita. This figure is much lower for Slovenia. If lignite is included, however, the figure is 900 tons per capita.

Much of the heat potential of coal used in furnaces, stoves, and ranges is wasted. Locomotives utilize only 7 percent of the total caloric potential of coal; ateam boilers, 65 percent; gas generators, 85 percent; and ranges and stoves, 12 percent. These losses cannot be remedied very much, as steam boilers, locomotives, ranges, and stoves would have to be redesigned to raise their efficiency factor.

Coal deposits are dwindling daily. Coal has become a raw material whose importance as a fuel is diminishing. Therefore, serious thought must be given to i use. It is high time that Yugoslavia used coal as fuel only when it is impossible to use other fuel. Foorer grades of coal should be used for fuel, and new heating installations should be con tructed to use poorer grades.

Much of the caloric value of coal burned in furnaces and other heating installations is lost on the surface of the boilers or steam pipes. Consequently, all such surfaces not serving for heating should be carefully insulated. Expertence has shown that 1,200 calories/per kilogram per hour are lost on one square meter of uninsulated surface where the temperature is 100 degrees centigrade higher than the surrounding air. This loss increases as the temperature increases. If the steam conductor is well insulated, the loss decreases to 350 calories per kilogram per hour per square meter, by using insulating flanges and valves the loss is further reduced to 220 calories per kilogram per hour per square meter.

Up to now Yugoslavia has planned the use of coal in accordance with so-called production and steam norms. Since every planner wants to be dependable and fears inferior quality and irregular delivery, he requisitions larger quantities of coal from year to year even though production remains stationary. As a result, mines produce coal in excess of current needs. It is stored in unsuitable warehouses, or even in the open, where it deteriorates in caloric value and often even in appearance.

A second result is that too much coal is fed into the grate so that it falls through unburned into the slag. Planning should take into account the maximum capacity of the grate of each boiler, taking into account both the surface area of the grate and the heating surface of the boiler. The equation BakeH should serve to determine the amount of coal to be used. B is the amount of coal in kilograms with regard to caloric value and quality which is stipulated for a particular grate; k_2 is the amount of coal in kilograms which burns in one hour on one square meter, approximately 8.° to 11 kilograms (an average of 9.5); and H is the heating surface of the boiler in square meters.

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